Technical Appendix E

Power Density Interference Analysis:

Power Density Analysis

Recall that the two-way target signal is given by the following equation:

$$\text{TARGET} = \frac{P_{FLR} G_{FLR}^2 \lambda^2 \sigma}{(4\pi)^3 R_{TGT}^4 L_{BEAM(FLR->TGT)}^2}$$

Under the following conditions,

P_{FLR} = 10 mW G_{FLR} = 35 dB λ = 3.92x10-3 m σ = 1 m2
R_{TGT} = 120 m $L_{BEAM(FLR->TGT)}$ = 3 dB

The target signal is 933 $x10^{-15}$ watts.

As was shown in the Interference Background section, target detection is lost when CW interference signals are 31 dB above the target signal. In this case, that interference signal would be $1.2x10^{-9}$ watts.

The power density of the CW interference signal (INT) is given by the following equation:

$$S = \frac{INT \cdot 4\pi}{\lambda^2 \cdot G_{FLR}}$$

In this case, S = $306x10^{-9}$ watts per square meter (W/m^2).

Power density limits must be specified as a function of the angle-of-arrival (θ), which is defined as the angle between the interference antenna boresight and the face of the FLR. This is shown in Figure 9.

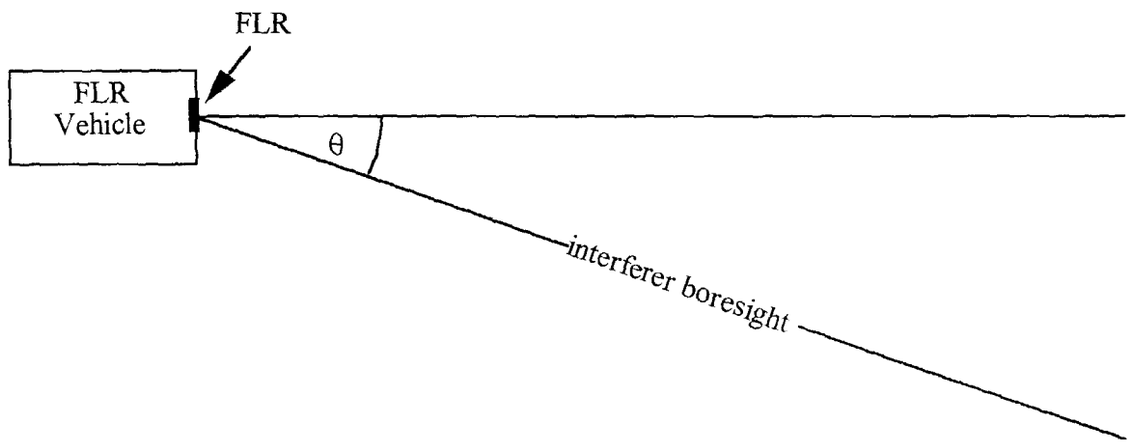
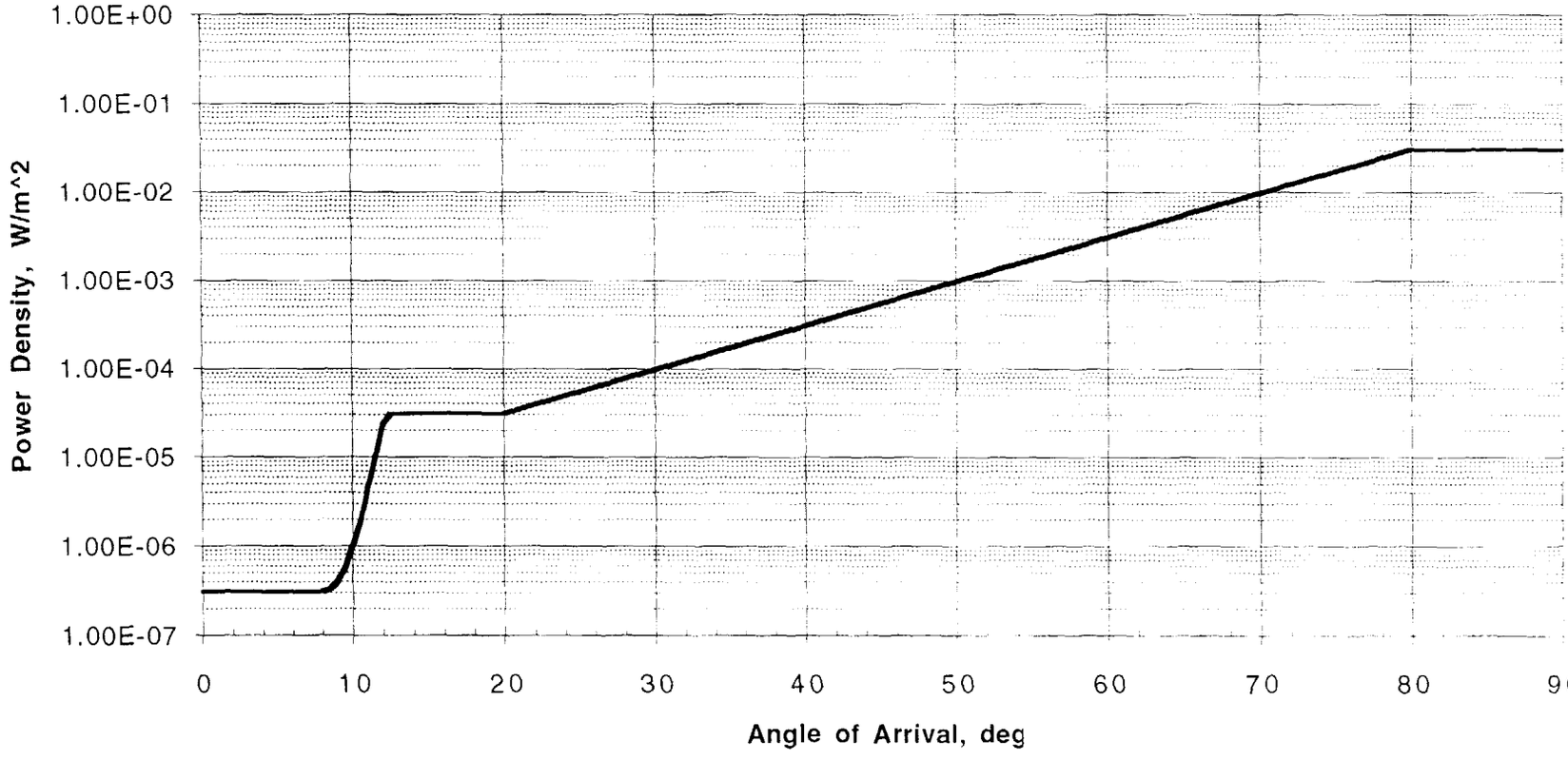


Figure 9 - Angle of Arrival

Figure 10 shows the power density limits as a function of angle-of-arrival.

Power Density Chart (120 m)



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January 5, 1995

Mr. Richard M. Smith
Chief, Office of Engineering and Technology
Federal Communications Commission
Washington, D.C. 20554

RE: ET Docket No. 94-124
RM-8308

Dear Mr. Smith:

General Motors and Hughes Electronics are voluntarily submitting certain materials to the rulemaking record of ET Docket No. 94-124 in support of the Commission's recent proposal to allocate certain frequencies for use by vehicular radar systems. The materials are comprised of, and elaborate upon, an ex parte presentation regarding certain issues in this rulemaking made to members of your staff today. An appropriate ex parte memorandum of the meeting has been submitted to the Secretary of the Commission, along with a redacted (public) version of the materials presented at the meeting for inclusion in the public docket.

The purpose of this letter is to request, pursuant to Section 0.459 of the FCC's rules, that certain portions of the submitted materials be withheld from routine public inspection. The pages for which confidentiality is requested are clearly marked "GMHE Proprietary." Our request for confidential treatment is limited to those pages containing proprietary data developed by Hughes Electronics relating to research and development of vehicular radar systems. The information for which we seek confidential protection is customarily guarded from our competitors, and public release of the proprietary information would cause substantial competitive harm to General Motors and Hughes. It would reveal to competitors certain competitively sensitive information developed at General Motors and Hughes' expense, permitting those competitors to benefit from the information without providing any commensurate benefit to General Motors and Hughes. The information for which we seek

protection qualifies for protection from public release under Section 0.457(d) of the Commission's rules and Section 552(b)(4) of the Freedom of Information Act.

As these materials are submitted voluntarily, we respectfully request, pursuant to Section 0.459(e) of the Commission's rules, that you return the confidential materials without consideration, should it be necessary to deny this request for confidential treatment. Alternatively, should you require additional justification for this request, please let us know, and we will provide it.

We appreciate your consideration of this request, and look forward to your response.

Sincerely,

Deborah K. Nowak-Vanderhoef

Deborah K. Nowak-Vanderhoef
Attorney